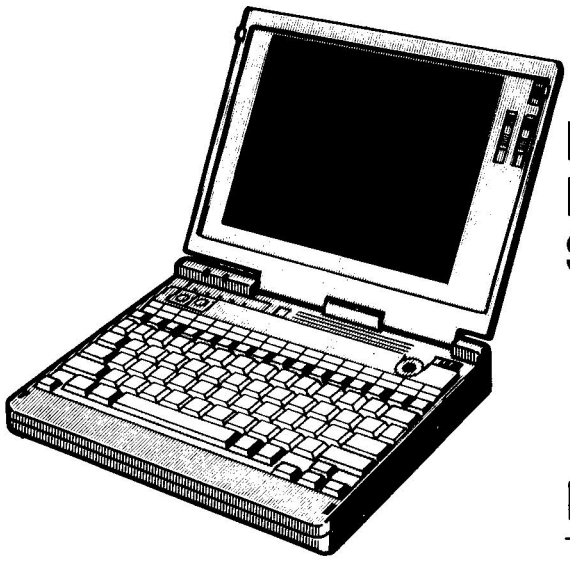
PC-6741

SHARP SERVICE MANUAL

CODE: 00ZPC6741SM2E



PERSONAL COMPUTER
PC-6700/6800 Series
SERVICE CHECKER MANUAL

PC-6741/6781
MODEL PC-6881

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SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

Note

For the PC-6700/6800 series, the following service tools are available. For the details of usage, etc., refer to each chapter.

1. DIAGNOSTICS TOOL

NO.	PARTS CODE	PRICE RANK	DESCRIPTION
1	UKOGC3074CSZZ	BH	PC-6800 DIAGNOSTIC DISK
2	UKOGC3075CSZZ	BH	PC-6700 DIAGNOSTIC DISK
3	UKOGG0110CSZZ	AU	LOOPBACK CABLE

2. BIOS UPDATE TOOLS

NO.	PARTS CODE	PRICE RANK	DESCRIPTION
1	UFLPC1001ACRA	BH	BIOS Update FD for PC-6700
	UFLPC1001ACSA	BH	BIOS Update FD for PC-6800
2	UKOG-1070ACZZ	**	BIOS Rewrite IC Card for PC-6700
	UKOG-1071ACZZ	**	BIOS Rewrite IC Card for PC-6800

3. PASSWORD REMOVE TOOLS

NO.	PARTS CODE	PRICE RANK	DESCRIPTION
1	UKOG-1073ACZZ	**	Password Remover IC Card

4. EXTENSION SERVICE TOOLS

NO.	PARTS CODE	PRICE RANK	DESCRIPTION
1	CPWBN1244AC01	BU	Extension Board for Video PWB
2	UKOG-1067ACZZ	BP	Extension Cable with PWB for P/S unit
3	UKOG-1068ACZZ	BF	Extension cable for Invertor PWB (for PC-6800 only)

CHAPTER 1. SERVICE DIAGNOSTIC

Note: The difference in diagnostic of the PC-6700 and the PC-6800 lies only in "4-6. LCD diagnostic." This chapter, therefore, basically explains the diagnostic of the PC-6700.

1. INTRODUCTION

This diagnostics is used to check the operating state of the system unit, keyboard and peripheral units, when an option device is interfaced to the PC-6700/6800 or when there is a state of error.
The following twelve kinds of diagnostics are provided to trace the exact cause.

Memory diagnostics
This diagnostics tests the standard and optional memory.

Real time clock & CMOS RAM diagnostics
This diagnostics tests the real time clock function and CMOS RAM.

Keyboard diagnostics
This diagnostics tests the keyboard and the numeric keypad functions.

Serial I/O diagnostics
This diagnostics tests the RS-232C line of the standard serial I/O.

Printer diagnostics
This diagnostics tests the printer function.

LCD diagnostics (PC-6700 or PC-6800)
This diagnostics tests the LCD.

Video subsystem diagnostics
This diagnostics tests the video subsystem function.

Coprocessor diagnostics
This diagnostics tests the coprocessor function

Micro Track Ball Diagnostics
This diagnostics tests the micro track ball function.

IC Card Diagnostics
This diagnostics tests the IC card.

Floppy disk drive diagnostics
This diagnostics tests the floppy disk drive function.

Hard disk drive diagnostics
This diagnostics tests the hard disk drive function.

2. STARTING UP THE DIAGNOSTIC PROGRAM

Set the diagnostic diskette to the floppy disk drive and supply power. Then the diagnostic program is automatically started and the following screen is displayed. (The following screen is for PC-6700)
Move the highlighting to the diagnostics you want to select, and press ENTER.

PC-6700 Series Service-man Diagnostics
Memory diagnostics
Real time clock & CMOS RAM diagnostics
Keyboard diagnostics
Serial I/O diagnostics
Printer diagnostics
LCD diagnostics
Video subsystem diagnostics
Coprocessor diagnostics
Micro track ball diagnostics
Floppy disk drive diagnostics
Hard disk drive diagnostics

• **TOOLS**

NO.	PARTS CODE	PRICE RANK	DESCRIPTION
1	UKOGC3074CSZZ	BH	PC-6800 DIAGNOSTIC DISK
2	UKOGC3075CSZZ	BH	PC-6700 DIAGNOSTIC DISK
3	UKOGG0110CSZZ	AU	LOOPBACK CABLE

3. DIAGNOSTIC PROGRAM LOADER

This diagnostic program loader is used to select and execute the each device diagnostic program.
Upon the start of the program loader, the diagnostic main menu is displayed. When one of twelve choice is selected, the respective diagnostic program is loaded from the floppy disk onto the main memory area. After it has been completed, the control moves to the diagnostic program to execute.
When the ESC is pushed in the diagnostic main menu, the program terminates and the control returns to the MS-DOS.

4. CHECK PROGRAM

All check programs are stored on the diagnostic program disk and used to check the state of a device after it has been installed or a specific device is tested when an error is reported.
In general, the valid keys at that time are displayed at the lowest line on the screen.

4-1. Memory diagnostics

This program tests the standard memory and the optional memory.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

Memory Diagnostics
Marching check
Display error table

(1) Marching check
The marching check for the all memory area is executed in the following manner:

1. Test data 5555H are written in the area to be checked.
2. The test data are read/compare at every word and test data AAAAH are written in the area to be checked.
3. The test data are read/compare at every word and test data 5555H are written in the area to be checked.
4. Test data 0000H are written in the area to be checked.
5. The test data are read/compare at every word and test data FFFFH are written in the area to be checked.
6. The test data are read/compare at every word and test data 0000H are written in the area to be checked.

The main memory is checked the following procedure:

1. The area from the address 40000H to 9FFFFH is tested by the marching test in an increment of 64KB.
2. The data in the address 00000H through 3FFFFH are copied onto the area after the address 40000H, then the address 00000H through 3FFFFH is tested by the marching test in an increment 64KB.

The extended memory is checked the following procedure:

1. The area after the address 100000H is tested by the marching test in an increment 64KB.

The expanded memory is checked the following procedure:

1. The expanded memory area is tested by the marching test in an increment 16KB (page frame)

• **OPERATION**
Specify the memory to be checked.

```
Check conventional memory ? [Yes No]
Check extended memory ? [Yes No]
Check expanded memory ? [Yes No]
```

Move the highlighting to the memory you want to check and press ENTER.

If an error occurs while executing the test, specify whether to abort or continue the test.

```
Error stop ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.

• **Error message**
The current error message is displayed on the lower side of the screen when an error is occurred during the executing of the task.

• **Range** shows absolute address at which an error occurred.

• **Bits** shows bits at which an error occurred.

(2) Display error table

This item displays the information of errors in the form of a table. The parameters shown on the screen are described below.

Mode shows memory at which an error occurred.
Range shows absolute address at which an error occurred.
Bits shows bits at which an error occurred.
Count shows number of errors.

4-2. Real time clock & CMOS RAM diagnostics

This program tests the real time clock function and CMOS RAM.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
Real Time Clock & CMOS RAM Diagnostics
Real time clock check
CMOS RAM check
Dump CMOS RAM
```

(1) Real time clock check

This test checks RTC timer function and RTC clock function. RTC timer check tests if the timer interrupt occurs correctly. RTC clock check tests if the clock works correctly.

(2) CMOS RAM check

This test item tests CMOS RAM.

• **Depression of ESC terminates the aging**
This test writes the specified data to the DMOS RAM, reads the data from CMOS RAM, and then compares them. The specified data to be writed are 55h, AAh and 55h. Also this test checks checksum and banks are selected correctly.

• **Operation**
Specify whether to repeat or do only once the test in the following message.

```
Aging mode ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When selection "Yes", the test will be repeated. If an error occurred, the test will be terminated immediately. On the other hand, when selecting "No", the test will be done only once.

(3) Dump CMOS RAM

This test dumps contents of C-MOS RAM.

4-3. Keyboard diagnostics

This program tests the keyboard and speaker functions.
The following menu appears when this test program is selected.

```
Keyboard Diagnostics
U.S. English keyboard check
Other keyboard check
```

Move the highlighting to the keyboard type you want to select, and press ENTER. Depression of ESC terminates the test.

(1) Keyboard check

The keyboard check begins with a graphic representation of the keyboard layout displayed on the screen. To test whether a particular key functions as it should, press the key. A square should display on the keyboard layout at that position if the key is working correctly. The test terminates when the ESC is pressed twice consecutively.

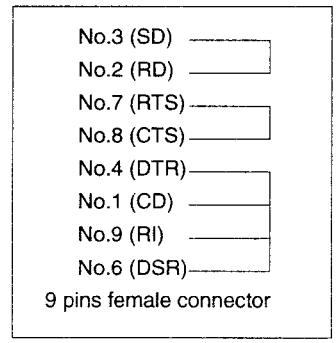
• **Operation**
Specify whether to check a numeric keypad or not.

```
Do you have a numeric keypad? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.

4-4. Serial I/O diagnostics

This program tests the function of the serial I/O with the loopback connector in use. (Loopback cable: UKOGG0110CSZZ)



The following shows how wires are connected.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
Serial I/O Diagnostics
Line check
Parameters check
Character transport check
```

(1) Line check

This item tests the following RS-232C line.

• **SD – RD line**
The program causes 256 bytes of data form 00H to FFH to be transmitted in the asynchronous mode, receives the data from the receive data line, compare that the transmitted data is the same as the received data. When the program considers that both data are the same, it transmits the next data.

• **RTS – CTS line**
By turning on/off the RTS signal, the program checks that the CTS signal function normally.

• **DTR – DSR – CD – RI line**
By turning on/off the DTR signal, the program checks that the DSR, CD, RI signal function normally.

(2) Parameter check

This test checks the serial I/O function by changing the baud rate, parity bit, stop bit and word length.
Parameters check is checked the following order.
The data 0 to 7FH is used for the word length 7 bits and 0 to FFH for the word length 8 bits.
Each parameter at that time is display on the screen.

(3) Character transport check

This test checks the character data entered on the keyboard are sent and received via the loopback connector and the received data are displayed on the screen.
As entry of characters to be transmitted will be prompted as shown below after the program started, you may enter 40 strokes of any character at a maximum. Depression of the ENTER starts the test and transmission takes place. The received data are displayed.

```
Sending data   : ■
Receiving data :
```

- **Operation**

There are the following common operation in the above test items.
Specify whether to repeat or do only once the test.

```
Aging mode? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
When entering "Yes", the following message is displayed. Specify whether to stop or continue the test, when an error has occurred.

```
Error stop? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.

- **Error message**

The error message is displayed on the lower side of the screen when an error is occurred during the executing of the task.

- **SD time out error**

Response to the transmit data is not found within the prescribed time.

- **RD time out error**

response to the receive data is not found within the prescribed time.

- **Transmit register not empty**

The transmit shift register failed to go empty.

- **Overrun error**

Character is received when the receive buffer is fully occupied with characters.

- **Framing error**

0 is found for the stop bit.

- **Parity error**

A parity error is met.

- **Data compare error**

Received data did not match with the transmit data.

4-5. Printer diagnostics

This program tests the printer interface and the printer connector with main unit.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
Printer Diagnostics
Status check
Print check
```

(1) Status check

The printer's status signals are checked and displayed. The following status categories are checked:
Bsy checks the printer's busy signal.

Ack checks that the printer can handshake with the main unit.

Pe checks that paper is set.

Sel shows when the printer is on-line.

Ioe checks that the printer's mechanics are OK.

An asterisk is displayed above a category when it's check completes normally.

(2) Print check

The test printing will not start until the five status categories in the status check all show an asterisk (above the categories). If a true hardware malfunction is detected, you will not be able to obtain an asterisk in that category. In that case, you will not be able to do a test print either.

4-6. LCD diagnostics

4-6-1. PC-6700 LCD diagnostic

This program tests the LCD by displaying the test pattern on the screen.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
LCD Diagnostics
Checker pattern check
Stripe pattern check
Shades of gray check
Frame check
```

(1) Checker pattern check

This test displays the checker pattern on the screen.
First, all display dots are displayed. Next, the test patterns of single dot, two dots, four dots and eight dots intervals are displayed and their reverse videos. The above procedure is repeated again.

(2) Stripe pattern check

This test displays the stripe pattern on the screen.
The vertical and horizontal stripes are displayed including reverse video. The above procedure is repeated again.

(3) Shades of gray check

This test displays the 32 shades of gray on the screen.

(4) Frame check

The frame line is displayed with each display mode. The above procedure is repeated again.

- **Operation**

When SPACE is pressed during the test, the test execution suspends. With the depression of the SPACE again, the test resumes. The test terminates by the depression of ESC.

4-6-2. PC-6800 LCD diagnostic

This program tests the LCD by displaying the test pattern on the screen.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
LCD Diagnostics
Checker pattern check
Stripe pattern check
Shades of color check
Frame check
```

(1) Checker pattern check

This test displays the checker pattern in red, green blue and white on the screen.
First, all display dots are displayed. Next, the test patterns of single dot, two dots, four dots and eight dots intervals are displayed and their reverse videos. The above procedure is repeated again.

(2) Stripe pattern check

This test displays the stripe pattern in red, green blue and white on the screen.
The vertical and horizontal stripes are displayed including reverse video. The above procedure is repeated again.

(3) Shades of color check

This test displays the shades of color in red, green blue and white on the screen.
The 64 shades of color in red, green, blue and white on the screen are displayed. The above procedure is repeated aging.

(4) Frame check

The frame line is displayed in each display mode. The above procedure is repeated again.

- **Operation**

When SPACE is pressed during the test, the test execution suspends. With the depression of the SPACE again, the test resumes. The test terminates by the depression of ESC.

4-7. Video subsystem diagnostics

This program tests video subsystem function.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
Video Subsystem Diagnostics
Video memory check
DAC check
Attribute check
Character set check
```

(1) Video memory check

This test checks the buffer in the video subsystem.
The video memory is tested by the maching test for four buffer bank (64KB).
The marching test for the all video memory area is executed in the following manner:

1. Test data 5555H are written in the area to be checked.
2. The test data are read/compare at every word and test data AAAAH are written in the area to be checked.
3. The test data are read/compare at every word and test data 5555H are written in the area to be checked.
4. Test data 0000H are written in the area to be checked.
5. The test data are read/compare at every word and test data FFFFH are written in the area to be checked.
6. The test data are read/compare at every word and test data 0000H are written in the area to be checked.

- **Operation**

Specify whether to repeat or do only once the test in following message.

```
Aging mode? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
If an error occurs while executing the test, specify whether to abort or continue the test.

```
Error stop? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
The test terminates by the depression of ESC.

- **Error message**

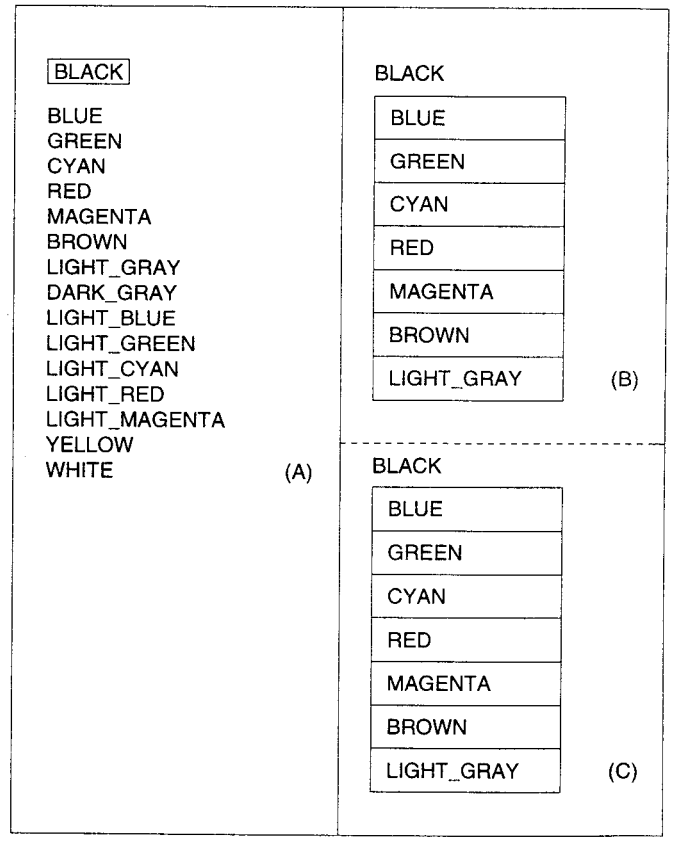
The current error message is displayed on the lower side of the screen when an error is occurred during the executing task.
Map shows map at which an error occurred.
Bits shows bits at which an error occurred.

(2) DAC check

This program tests the digital-to-analog converter in the video subsystem with each display mode.

(3) Attribute check

This program displays 16 foreground, 8 background and 8 blinking shades of gray.



The following figure is displayed on the screen.
The portion (A) shows 16 foreground shades of gray.
The portion (B) shows 8 background shades of gray
The portion (C) shows 8 blinking shades of gray

(4) Character set check

This program displays characters on the screen normally on an 80 × 25 test mode display.
Example: The following figure will be displayed on the screen.

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▸		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	-1	☺	◂	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	-2	●	↕	"	2	B	R	b	r	é	Æ	ó	▒	┬	╥	Γ	≥
3	-3	♥	‼	#	3	C	S	c	s	â	ô	ú	┆	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	-6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
10	-A	■	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	n
13	-D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	2
14	-E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▀	∩	

4-8. Coprocessor diagnostics

This program tests the coprocessor function.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

> **Coprocessor Diagnostics**
> Function check

(1) Function check

This test has the following four items.

Initialize check checks that the coprocessor is initialized, when the initialize command was issued.

Arithmetic check checks that the coprocessor can calculate, when the arithmetic command was issued.

Interrupt check checks the interrupt occurs in the coprocessor, when the division by 0 command was issued.

Reset check checks the coprocessor is reseted, when the reset command was issued.

4-9. Micro track ball diagnostics

This program tests the micro track ball function.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

> **Micro Track Ball Diagnostics**
> Function check

(1) Function check

The following screen is displayed.

> SW1 = OFF X_COUNT = 000
> SW2 = OFF Y_COUNT = 000

When the button 1 is pressed, check that the word "ON" is displayed at the "SW1" on the screen and when it is released, the button "OFF" is displayed there. In the same way, check the button 2. When the ball is moved, check that the figure at "X_COUNT" and "Y_COUNT" on the screen increases or decreases.

4-10. IC card diagnostics

This program tests the IC cards.
The IC cards that can be tested are the modem card (CE-671M) and SRAM card. The following menu appears when this program is selected.
Move the highlighting to the item you want to select, and press ENTER.
Depression of ESC terminates the test.

> **IC Card Diagnostics**
> Modem card check
> SRAM card check

(1) Modem card check

This program tests the modem by sending, receiving and comparing the data in the analog loop back mode. Then the optional modem port must be installed.

- **Operation**

Insert the modem card to the IC card slot. Then set the setup screen to the proper setting.
Move the highlighting to the baud rate you want to check, and press ENTER. Depression of ESC terminates the test.

> Set baud rate ? [300 1200 2400]

- **Error message**

The error message is displayed on the lower side of the screen when an error is occurred during the executing of the task.

- SD time out error
  Response to the transmit data is not found within the prescribed time.
- RD time out error
  Response to the receive data is not found within the prescribed time.
- Transmit register not empty
  The transmit shift register failed to go empty.
- Overrun error
  Character is received when the receive buffer is fully occupied with characters.
- Framing error
  0 is found for the stop bit.
- Parity error
  A parity error is met.
- Data compare error
  Received data did not match with the transmit data.

(2) SRAM card check

The marching check for the all memory area on the SRAM card is executed.

- **Caution**

> When this test is executed, all the contents in the IC card are destroyed. So be very careful with test.

- **Operation**

Insert the SRAM card to the IC card slot.
Move the highlighting to the capacity of the SRAM card you want to check, and ENTER. Depression of ESC terminates the test.

> SRAM card capacity? [64KB 128KB 256KB 512KB 1MB 2MB 4MB 8MB 16MB 32MB]

Specify whether to repeat or do only once the test in the following message.

```
Aging mode ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When selection "Yes", the test will be repeated. If an error occurred, the test will be terminated immediately. On the other hard, when selection "No", the test will be done only once.

- **Error message**

If an error occurred, bits at which an error occurred are shown on the low side.

4-11. Floppy disk drive diagnostics

This program tests the internal 3-1/2" floppy disk drive and the external 5-1/4" floppy disk drive.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
Floppy Disk Drive Diagnostics
Read drive status
Write, read & compare check
Read only check
00 track sensor adjustment
Target sector read check
Display error table
```

(1) Read drive status

This item displays the current status of the floppy disk drive(s). While this program is executing, the system periodically detect some status change, it causes the buzzer to sound and displays the new status on the screen.

- **Operation**

Pressing any key, the test terminates.

(2) Write, read & compare check

This test checks the write/read operation.
The system writes the specified data to the floppy disk, reads the same data from the floppy disk, and then compares them.
The specified data to be written is 00H to FFH increment pattern when the pass count is 0, otherwise the data is 2bytes repetitive pattern of "B6DBH".

- **Caution**

When this test is executed, all the contents stored in the floppy disk are destroyed. So be very careful with this test. In addition, it is necessary to release "Write Protect".

- **Operation**

When this test is selected, the following message is displayed.

```
Please insert the formatted scratch disk in the drive.
```

At the time, insert the test disk in the drive to be checked and press ENTER. If the drive is not ready or the test disk isn't inserted in the drive, the following message is displayed and the test terminates.

```
Drive not ready.
```

Specify whether to check the drive or not in the following message.

```
Drive_A (1.44MB) test ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. The string in the parenthesis represents the capacity of the disk.

Specify the range of cylinders to be checked in the following message.

```
Cylinder range ?
Drive_A [00 ↔ 79] = ■■
```

Type the starting cylinder number at first and press ENTER. Then type the ending cylinder number and press ENTER.
Specify the number of sector accessed by one instruction in the following message.

```
Sector count ?
Drive_A [1, 3, 18] = ■
```

Type the sector count in the displayed count and press ENTER.
Specify the number of retrial in the following message, when an error has occurred.

```
Retry count ? [0 ↔ 4] = ■
```

Type the retry count in the displayed range and press ENTER.
Specify whether to stop or continue the test, when an error has occurred.

```
Error stop ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
Specify whether to execute the test or not.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When entering "No", control exits to "specification of the checked drive". On the other hand, when entering "Yes", starts the test.
While the system executes the test, by pressing SPACE, it stops the test. At the time, by pressing SPACE again, the system continues the test. Also by pressing ESC, the test terminates. The depression of ESC is always effective during this test.
The lower left screen shows pass count and test point represented by physical address as follows:

```
Pass count =  ■■■■■
Test point =  TT.H.SS
```

"TT" means the track, "H" means the head and "SS" means the sector.
In addition, the lower right screen shows the test mode and the test drive.

```
Test mode: Write Test drive: Drive_A
```

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on the lower right screen and increments the right-hand error counter.
If the error stop is set to "No", the system updates the error counter every time an error occurs and continues to execute the test. The system only displays the newest error information in the lower right. On the other hand, if the error stop is set to "Yes", the system stops the test if an error occurs. At the time, by pressing ENTER the system continues the test. On the other hand, by pressing ESC, the test terminates. For details of error message, see "12-4-10-7. Error message".

(3) Read only check

This test checks that data is properly read from the floppy disk drive.

- **Operation**

When this test is selected, the following message is displayed.

```
Please insert the formatted scratch disk in the drive.
```

At the time, insert the test disk in the drive to be checked and press ENTER. If the drive is not ready or the test disk isn't inserted in the drive, the following message is displayed and the test terminates.

```
Drive not ready.
```

Specify whether to check the drive or not in the following message.

```
Drive_A (1.44MB) test ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. The string in the parenthesis represents the capacity of the disk.
Specify the range of cylinders to be checked in the following message.

```
Cylinder range ?
Drive_A [00 ↔ 79] = ■■
```

Type the starting cylinder number at first and press ENTER. Then type the ending cylinder number and press ENTER.
Specify the number of sector accessed by one instruction in the following message.

```
Sector count ?
Drive-A [1, 3, 18] = ■■
```

Type the sector count in the displayed count and press ENTER.
Specify the number of retrial in the following message, when an error has occurred.

```
Retry count ? [0 ↔ 4] = ■
```

Type the retry count in the displayed range and press ENTER.
Specify whether to stop or continue the test, when an error has occurred.

```
Error stop ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
Specify whether to execute the test or not.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When selecting "No", control exits to "specification of the checked drive". On the other hand, when selecting "Yes", starts the test.
While the system executes the test, by pressing SPACE, it stops the test. At the time, by pressing SPACE again, the system continues the test. Also by pressing ESC, the test terminates. The depression of ESC is always effective during this test.
The lower left screen shows pass count and test point represented by physical address.

```
Pass count =  ■■■■■
Test point =  TT.H.SS
```

"TT" means the track, "H" means the head and "SS" means the sector.
In addition, the lower right screen shows the test mode and the test drive.

```
Test mode: Read Test drive: Drive_A
```

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on the lower right screen and increments the right-hand error counter.
If the error stop is set to "No", the system updates the error counter every time an error occurs and continues to execute the test. The system only displays the newest error information in the lower right. On the other hand, if the error stop is set to "Yes", the system stops the test if an error occurs. At the time, by pressing ENTER the system continues the test. On the other hand, by pressing ESC, the test terminates. For details of error message, see "12-4-10-7. Error message".

(4) 00 Track sensor adjustment

This program checks the 00 track sensor which detects the cylinder 0. The system moves the head from the cylinder 0 to cylinder 4 and returns the head to the cylinder 0. With such an operation, the system can observe a signal from the 00 track sensor as a pulse.

- **Operation**

Specify the drive to be checked in the following message.

```
Test drive ? [Drive_A]
```

Move the highlighting to the drive you want to select, and press ENTER.
Specify whether to repeat or do only once the test in the following message.

```
Aging mode ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When selecting "Yes", the test will be repeated. On the other hand, when selection "No", the test will be done only once.
Specify whether to execute the test or not.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When selecting "No", control exits to "specification of the checked drive". On the other hand, when selecting "Yes", starts the test.
In the aging mode, by pressing SPACE, it stops the test. At the time, by pressing SPACE again, the system continues the test.
Also by pressing ESC, the test terminates. The depression of ESC is always effective during this test. Otherwise, by pressing ESC, the test terminates. However, by pressing ENTER, the test is repeated again.

- **Error processing**

While the system executes the test, if an error occurs, the system displays the kind of error at the lower screen. In this state, by pressing any key, the test terminates. For details of error message, see "12-4-10-7. Error message".

(5) Target sector read

This test is used to continue reading the specific sector.

- **Operation**

Specify the disk to be checked in the following message.

```
Please insert the alignment or formatted disk in the drive.
What kind of the test disk do you use ?
[Alignment_disk Formatted_disk]
```

At the time, insert the test disk in the drive to be checked and move the highlighting to the disk you inserted, and press ENTER. If the drive is not ready or the test disk isn't inserted in the drive, the following message is displayed and the test terminates.

```
Drive not ready.
```

Specify the drive to be checked in the following message.

```
Test drive ? [Drive_A]
```

Move the highlighting to the drive you want to select, and press ENTER.
Specify the cylinder number to be checked in the following message.

```
Cylinder number ? [00 ↔ 79] = ■■
```

Type the cylinder number to be checked in the displayed range and press ENTER.
Specify the head number to be checked in the following message.

```
Head number ? [0 ↔ 1]
```

Type the head number to be checked in the displayed range and press ENTER.
Specify the sector range to be checked in the following message.

```
Sector range ? [1 ↔ 18] = ■■ - ■■
```

Type the first sector number and the last sector number of the cylinder range to be checked and press ENTER.

NOTE: When the alignment disk is selected, this specification of sector range is not displayed.
Specify whether to stop or continue the test if an error occurs while executing test.

```
Error stop ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
Specify whether to execute the test or not.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. when selecting "No", control exits to "specification of the checked drive". On the other hand, when selecting "Yes", starts the test.
While the system executes the test, by pressing SPACE, it stops the test. At the time, by pressing SPACE again, the system continues the test. Also by pressing ESC, the test terminates. The depression of ESC is always effective during this test.
The lower left screen shows pass count and test point represented by physical address.

```
Pass count = ■■■■■
Test point = TT.H.SS
```

"TT" means the track, "H" means the head and "SS" means the sector In addition, the lower right screen shows the test mode and the test drive.

```
Test mode: Read Test drive: Drive_A
```

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on the lower right screen and increments the right-hand error counter. If the error stop is set to "No", the system updates the error counter every time an error occurs and continues to execute the test. The system only displays the newest error information at the lower right screen. On the other hand, if the error stop is set to "Yes", the system stops the test if an error occurs. At the time, by pressing ENTER the system continues the test. On the other hand, by pressing ESC, the test terminates. For details of error message, see "12-4-10-7. Error message".

(6) Display error table

All error kinds, locations and counts are displayed for "Write-read check" and "Read only check". However, this error information is limited to 40 locations.

- **Operation**

By pressing any key, the test terminates.

(7) Error messages

- **FDC busy**

A read or write command is in process.

- **FDC seek error**

The system received a FAULT signal from the device or the seek operation was abnormally completed.

- **Communication error**

Handshake error occurred between the CPU and FDC.

- **Equipment check**

The system received a FAULT signal from a device or did not detect a track 00 signal in the specified time period while the recalibrate operated.

- **Missing address mark**

The address mark in the ID section was not detected.

- **FDC no data**

The ID without CRC error was not detected.

- **FDC invalid command**

A command written to the FDC was invalid.

- **Drive not ready**

The device being specified was in the not ready state.

- **Record not found**

The sector specified in the ID field could not be detected in the track

- **DMA boundary error**

DMA error across 64KB boundary.

- **Write protected error**

The system detected write protection.

- **Seek error**

Shows the occurrence of a error during seek.

- **Bad controller**

Shows the occurrence of any abnormality in the controller.

- **Bad address mark**

Shows the occurrence of an address mark read error.

- **Bad CRC error**

Shows the occurrence of a CRC error during data error.

- **Bad command error**

A command was specified which was not in BIOS.

- **Compare error**

Data being written did not accord with data being read.

- **Others error**

Shows the occurrence of other errors not described above.

4-12. Hard disk drive diagnostics

This program tests the hard disk drive.
The following menu appears when this test program is selected.
Move the highlighting to the item you want to select, and press ENTER. Depression of ESC terminates the test.

```
Hard Disk Drive Diagnostics
Drive type check
Write, read & compare check
Read only check
Random seek check
Dump and Patch
Disk controller check
Display error table
```

(1) Drive type check

This test item checks the specification of the drive if the drive is ready. The capacity, cylinder numbers, head numbers and sector numbers are displayed.

- **Operation**

Depression of any key terminates the test.

(2) Write, read & compare check

This item checks the write/read operation.
The system writes the specified data to the hard disk, reads the same data from the floppy disk, and then compares them.
The specified data to be written is 00H to FFH increment pattern when the pass count is 0, otherwise the data is 2bytes repetitive pattern of "CB33".

- **Caution**

When this test is executed, all the contents stored in the disk are destroyed. So be very careful with this test.

- **Operation**

Specify the range of cylinders to be checked in the following message.

```
Cylinder range ?
[000 ↔ 613] = ■■■ - ■■■
```

Type the starting cylinder number at first and press ENTER. Then type the ending cylinder number and press ENTER.
Specify the number of sector accessed by one instruction in the following message.

```
Sector count ?
[01 ↔ 17] = ■■
```

Type the sector count in the displayed range and press ENTER.
Specify the number of retrial in the following message, when an error has occurred.

```
Retry count ?
[0 ↔ 4] = ■
```

Type the retry count in the displayed range and press ENTER.
Specify whether to stop or continue the test in the following message, when an error has occurred.

```
Error stop ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
Specify whether to execute the test or not in the following message.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When entering "No", control exits to "specification of the cylinder range". On the other hand, when entering "Yes", starts the test.
While executing the test, by pressing SPACE, the system stops the test. At the time, by pressing SPACE again, the system continues the test. Also by pressing ESC, the test terminates. The depressing of ESC is always effective during this test.
the lower left screen shows the pass count and the test point represented by physical address as follows:

```
Pass count = ■■■■■
Test point = CCC.HH.SS
```

"CCC" means the cylinder, "HH" means the head and "SS" means the sector.
In addition, the lower right screen shows the test mode.

```
Test mode: Write
```

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on lower right screen and increments the right-hand error counter.
If the error stop is set to "No", the system updates the error counter every time an error occurs and continues to execute the test. The system only displays the newest error information in the lower right screen. On the other hand, if the error stop is set to "Yes", the system stops the test if an error occurs. At the time, by pressing ENTER, the system continues the test and by pressing ESC, the test terminates.
For details of error message, see "12-4-11-8. Error message".

(3) Read only check

The test checks if the read operation is normal by reading the data on the hard disk.

- **Operation**

Specify the range of cylinders to be checked in the following message.

```
Cylinder range ?
[000 ↔ 613] = ■■■ - ■■■
```

Type the starting cylinder number at first and press ENTER. Then type the ending cylinder number and press ENTER.
Specify the number of sector accessed by one instruction in the following message.

```
Sector count ?
[01 ↔ 17] = ■■
```

Type the sector count in the displayed range and press ENTER.
Specify the number of retrial in the following message, when an error has occurred.

```
Retry count ?
[0 ↔ 4] = ■
```

Type the retry count in the displayed range and press ENTER.
Specify whether to stop or continue the test in the following message, when an error has occurred.

```
Error stop ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
Specify whether to execute the test or not in the following message.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. when entering "No", control exits to "specification of the cylinder range". On the other hand, when entering "Yes", starts the test.
While executing the test, by pressing SPACE, the system stops the test. At the time, by pressing SPACE again, the system continues the test. Also by pressing ESC, the test terminates. The depressing of ESC is always effective during this test.
The lower left screen shows the pass count and the test point represented by physical address as follows:

```
Pass count = [redacted]
Test point =  CCC.HH.SS
```

"CCC" means the cylinder, "HH" means the head and "SS" means the sector.
In addition, the lower right screen shows the test mode.

```
Test mode: Read
```

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on lower right screen and increments the right-hand error counter.
If the error stop is set to "No", the system updates the error counter every time an error occurs and continues to execute the test. The system only displays the newest error information in the lower right screen. On the other hand, if the error stop is set to "Yes", the system stops the test if an error occurs. At the time, by pressing ENTER, the system continues the test and by pressing ESC, the test terminates.
For details of error message, see "12-4-11-8. Error message".

(4) Random seek check

The test checks if the seek operation is normal by accessing the hard disk at random.

- **Operation**

Specify whether to stop or continue the test in the following message, when an error has occurred.

```
Error stop ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.
Specify whether to execute the test or not in the following message.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When entering "No", control exits to "specification of the cylinder range". On the other hand, when entering "Yes", starts the test.
While executing the test, by pressing SPACE, the system stops the test. At the time, by pressing SPACE again, the system continues the test. Also by pressing ESC, the test terminates. The depressing of ESC is always effective during this test.
The lower left screen shows the pass count and the test point represented by physical address as follows:

```
Pass count = [redacted]
Test point =  CCC.HH.SS
```

"CCC" means the cylinder, "HH" means the head and "SS" means the sector.
In addition, the lower right screen shows the test mode.

```
Test mode: Read
```

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on lower right screen and increments the right-hand error counter.
If the error stop is set to "No", the system updates the error counter every time an error occurs and continues to execute the test. The system only displays the newest error information in the lower right screen. On the other hand, if the error stop is set to "Yes", the system stops the test if an error occurs. At the time, by pressing ENTER, the system continues the test and by pressing ESC, the test terminates.
For details of error message, see "12-4-11-8. Error message".

(5) Dump and Patch

The contents of the disk, the hexadecimal figure with the ASCII character, are displayed on the screen and are patched up. The contents of a sector (512KB) is displayed in two parts: the first half (256KB) and the second half (256KB).

- **Operation**

Specify the physical address to be dumped and patched.

```
Physical address = CCC.HH.SS
```

Type the cylinder number displayed by "CCC" and press ENTER. Type the head number displayed by "HH" and press ENTER. Type the sector number displayed by "SS".
When the entrys have been complete, the screen appears with the data of the specified sector on the screen.
At this time, by pressing PGDN, a next sector or a second half of the sector is displayed and by pressing PGUP, a previous sector or a first half of the sector is displayed on the screen.
Moreover, by pressing SPACE, control exits "specify the physical address" and by pressing ESC, the test terminates.
To patch up, move the highlighting to the location you want to patch and type the figure with hexadecimal and press ENTER. The following message display on the lower screen. At this time, specify whether to update or not.

```
Update data ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER.

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on lower right screen.
For details of error message, see "12-4-11-8. Error message".

(6) Disk controller check

The test checks the disk controller.

- **Operation**

Specify whether to repeat or do only once the test in the following message.

```
Aging mode ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When selection "Yes", the test will be repeated. On the other hand, when selecting "No", the test will be done only once.
Specify whether to execute the test or not in the following message.

```
Test start ? [Yes No]
```

Move the highlighting to the mode you want to select and press ENTER. When entering "No", control exits to "specification of the aging mode". On the other hand, when entering "Yes", starts the test. Depression of ESC terminates the aging.

- **Error processing**

If the system detects an error while it executes the test, it displays the kind of error and where the error occurs on lower right screen.
For details of error message, see "12-4-11-8. Error message".

(7) Display error table

All error kinds, locations and counts are displayed for "Write-read check", "Read only check" and "Random seek check". However, this error information is limited to 40 locations.

- **Operation**

By pressing any key, the test terminates.

(8) Error message

- **Bad command**

Shows that an invalid command is received.

- **Bad address mark**

Shows that the occurrence of an address mark read error.

- **Record not found**

Shows that the specified record is not found.

- **DMA boundary error**

Shows that the DMA error across 64Kb boundary.

- **Bad track**

Shows that a bad track is found.

- **Bad ECC on disk read**

Shows that the occurrence of an ECC error during data read.

- **Data corrected**

A error occurred but shows that the error was corrected by ECC.

- **Seek error**

Shows that the occurrence of an error during seek.

- **Bad controller**

Shows that the occurrence of any abnormality in the controller.

- **Time out error**

Shows that an interrupt responses from the controller was not received in the prescribed time.

- **Compare error**

Shows that an unmatch of the write data with the read data.

- **Others error**

Shows that the occurrence of other errors not described above.

CHAPTER 2. BIOS UPDATE

1. OUTLINE

There are two ways to update the BIOS. The one updates the BIOS by using the "BIOS Update FD", the other updates it by using the "BIOS Rewrite IC Card".

• NOTE

The version number of the BIOS that is installed actually may be different from the version number seal that is pasted on the flash memory

• TOOL

NO.	PARTS CODE	PRICE RANK	DESCRIPTION
1	UFLPC1001ACRA	BH	BIOS Update FD for PC-6700
	UFLPC1001ACSA	BH	BIOS Update FD for PC-6800
2	UKOG-1070ACZZ	**	BIOS Rewrite IC Card for PC-6700
	UKOG-1071ACZZ	**	BIOS Rewrite IC Card for PC-6800

1-1. BIOS update by disk

The "BIOS Update FD" is required to update the BIOS. At this time, the MS-DOS system must boot up. The procedure of updating the BIOS is as follows:

(1) Insert the "BIOS Update FD" to the floppy disk drive.

(2) Turn on the power.

(3) The system boots up and the following message is displayed.

```
BIOS Version Number : V-X.XX(XX)
```

The above message indicates the version number of the current BIOS. Check the version number.

(4) At the A>prompt, type as follows:

```
go
```

and press ENTER. The BIOS is updated automatically and the system boots up. Then the version number of the BIOS is displayed again. Check it and that the BIOS was updated.
However the system may not boot automatically. Then if the following message is displayed in the lower side, the BIOS has already been updated. There fore the system should be booted by turning off/on the power switch

```
Booting system . . . .
```

The system doesn't boot up and the following messages may be displayed.

```
10 00: Invalid configuration information - run SETUP program
Press the F1 key to continue, F2 to run the SETUP program
```

Then operate keys as shown below and the system boots up again.

```
F2 → SPACE → F3 → ESC → F4
```

Also after the system booted up, the following message may be displayed.

```
Error: Shadow BIOS or video ROM disabled.
```

The above message indicates that the shadow BIOS & video ROM is disabled. In order to enable the shadow BIOS & video ROM, operate keys as shown below and the page 3/4 in the setup screen should be displayed.

FN+F1 → FN+↑ → FN+↑

Then set the field of the shadow BIOS & video ROM as shown below.

Shadow BIOS ROM: Enable Shadow Video ROM: Enable

Operate keys as shown below and the system boots up again.

ESC → F4

1-2. BIOS update by flash card

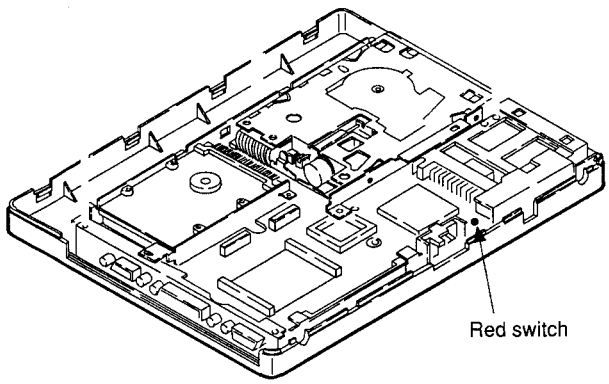
The BIOS Update Flash Card is required to update the BIOS. The system need not boot up. The procedure of updating the BIOS is as follows:

(1) Remove the rear cabinet.

(2) Insert the BIOS Update Flash Card to the IC card slot.

(3) Turn on the power.

(4) Press the red switch described below.



The BIOS is updated automatically and the system boots. Check the BIOS Reference ID on the screen, when the system boots up.

1-3. BIOS load to flash card

The BIOS Load Image File in the BIOS Update Disk is included. The BIOS can be loaded to a flash card by using this BIOS Load Image File. But the size of the flash card must have 1M bytes or higer capacity. The procedure of loading the BIOS to the flash card is as follows:

(1) Insert the BIOS Update Disk to the floppy disk drive.

(2) Insert the flash card to the IC card slot.

(3) At the A>prompt, type as follows:

bl

and press ENTER. The BIOS is loaded to the flash card automatically. Then the system boots up but the BIOS doesn't load to the unit.

CHAPTER 3. PASSWORD REMOVE

1. OUTLINE

The "Password Remove IC Card" is required to remove the password. The system need not boot.

• CAUTION

After this password remove was executed, the BIOS on the unit is destroyed and the system cannot boot. So the BIOS must be installed by using the BIOS Update Flash Card

The procedure of removing the password is as follows:

1-1. Password remove

(1) Remove the rear cabinet.

(2) Insert the Password Remove Flash Card to the IC card slot.

(3) Turn on the power.

(4) Press the red switch described below.

• TOOL

NO.	PARTS CODE	PRICE RANK	DESCRIPTION
1	UKOG-1073ACZZ	**	Password Remover IC Card

The password is removed automatically but the system doesn't boot since the BIOS isn't installed. Therefore the BIOS should be installed according to **1-2. BIOS update by flash card.**

CHAPTER 4. SERVICE TOOL

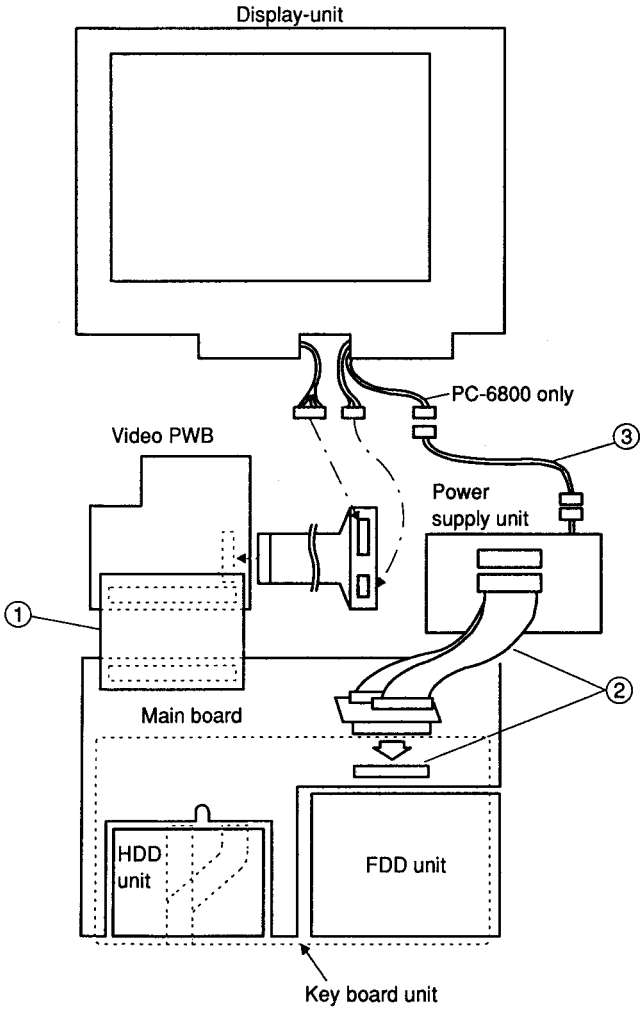
1. OUTLINE

For the PC-6700/6800 series, the following service tools are available to check the PCBs. the usage and the compositions are given below.

- **SERVICE TOOL**

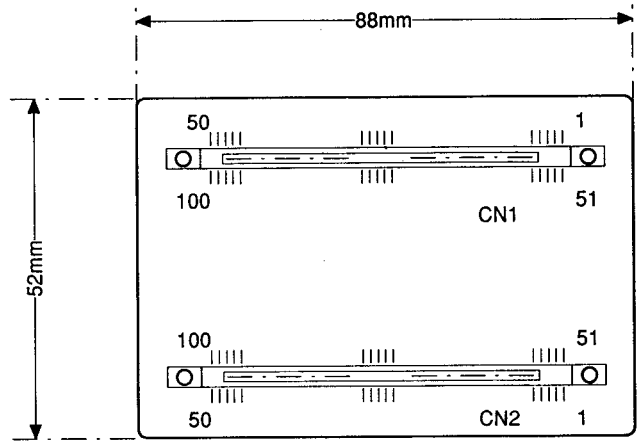
NO.	PARTS CODE	PRICE RANK	DESCRIPTION
①	CPWBN1244AC01	BU	Extension Board for Video PWB
②	UKOG-1067ACZZ	BF	Extension Cable with PWB for P/S unit
③	UKOG-1068ACZZ	BF	Extension Cable for Invertor PWB

2. Connection



3. Description of tools

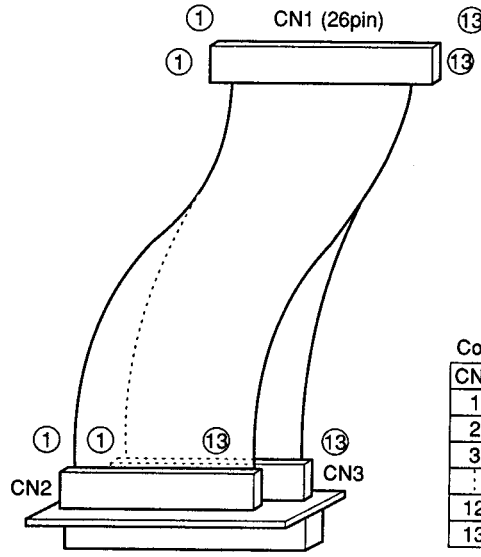
① TOOL 1: Expansion Board for Video PWB [CPWBN1244AC01]



[CN1] QCNCM1191ACZZ
[CN2] QCNCM1186ACZZ

② TOOL 2: Extension Cable with PWB for P/S unit [UKOG-1067ACZZ]

<Cable>

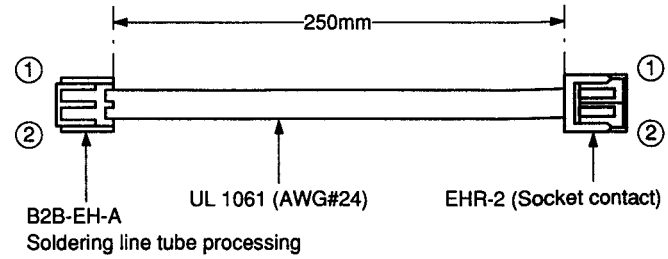


Connector connection

CN1	CN2	CN1	CN3
1	1	14	1
2	2	15	2
3	3	16	3
⋮	⋮	⋮	⋮
12	12	25	12
13	13	26	13

✱ The above figure is when viewed from the PWB surface. (The dotted lines show the part is attached on the rear.)

③ TOOL 3: Extension Cable for Invertor PWB [UKOG-1068ACZZ] (PC-6881 only)



Soldering line tube processing